

THE CLAIMS

What is claimed is:

1. A drill guide comprising:
a guide barrel for receiving a bone tool for creating a hole in bone; and
5 an alignment assembly associated with the guide barrel for aligning the
bone tool with a selected first or second fastener hole of a bone
plate, the alignment assembly comprising a location post
configured to be at least partially received within a recess in the
bone plate;
10 wherein the location post is pivotable about the bone plate recess to allow the
guide barrel to be selectively aligned with the first and second fastener holes.
2. The drill guide of **claim 1**, wherein the location post is configured to axially
lock the drill guide to the bone plate.
3. The drill guide of **claim 2**, wherein the location post further comprises a
15 plurality of resilient finger elements configured to frictionally engage the bone plate
recess to thereby axially lock the drill guide to the bone plate.
4. The drill guide of **claim 3**, wherein the resilient finger elements further
comprise at least one ridge configured to engage threads in the bone plate recess.
5. The drill guide of **claim 1**, the alignment assembly further comprising a
20 housing having a first axial bore configured to slidably receive at least a portion of
the location post.
6. The drill guide of **claim 5**, the location post and housing further each
comprising a distal end, the location post having a retracted position in which the

location post distal end is located a first distance from the distal end of the housing, and an extended position in which the location post distal end is located a second distance from the distal end of the housing, wherein the second length is greater than the first length.

5 7. The drill guide of **claim 6**, the alignment assembly further comprising a spring element disposed at least partially within a second axial bore in the housing to bias the location post to the extended position.

8. The drill guide of **claim 7**, the guide barrel further comprising a bore with a bore axis, and a distal plate-engaging end, wherein the distal plate-engaging end
10 comprises a nose portion configured to be received within the first or second fastener hole to align the bore with the bone screw hole.

9. The drill guide of **claim 8**, wherein the nose portion comprises a conical shape.

10. The drill guide of **claim 8**, the housing first axial bore and the guide barrel
15 bore forming an acute angle therebetween.

11. The drill guide of **claim 7**, wherein when the location post is received within the bone plate recess and the location post is in the extended position, the guide barrel distal end is located a first distance from the top surface of the bone plate.

12. The drill guide of **claim 7**, wherein when the location post is received within
20 the bone plate recess and the location post is in the retracted position, the guide barrel distal end contacts the selected bone screw hole.

13. The drill guide of **claim 1**, the drill guide further comprising a handle associated with the guide barrel, the handle configured to be selectively rotatable with respect to the guide barrel in a first plane.
14. The drill guide of **claim 13**, wherein the first plane is substantially
5 perpendicular to the longitudinal axis of the guide barrel bore.
15. The drill guide of **claim 13**, further comprising a handle swivel assembly having a locked position in which the handle can not rotated with respect to the guide barrel, and an unlocked position in which the handle is freely rotatable with respect to the guide barrel.
- 10 16. The drill guide of **claim 15**, wherein the swivel assembly comprises at least one non-metallic bearing.
17. The drill guide of **claim 15**, wherein the swivel assembly comprises a drain hole configured to allow fluid to drain from the assembly subsequent to sterilization of the drill guide.
- 15 18. The drill guide of **claim 1**, wherein the location post is axially fixed to the alignment assembly.
20. A surgical drill guide comprising:
a handle,
a guide barrel having a proximal end associated with the handle and a
20 distal end configured to engage an inner surface of a fastener
hole of a bone plate, the guide barrel further comprising a bore
configured to receive a bone cavity forming tool; and
an alignment assembly associated with the guide barrel for aligning the
bone tool with a selected first or second fastener hole, the

alignment assembly comprising a location post configured to be at least partially received within a recess in the bone plate; wherein the location post is pivotable within the recess to allow the guide barrel to be selectively aligned with the first and second fastener holes so that the tool may
5 be extended through the guide barrel to form a cavity in a bone underlying the selected fastener hole.

21. The drill guide of **claim 20**, wherein the location post is configured to axially lock the drill guide to the bone plate.

22. The drill guide of **claim 21**, wherein the location post further comprises a
10 plurality of resilient finger elements configured to frictionally engage the bone plate recess to thereby axially lock the drill guide to the bone plate.

23. The drill guide of **claim 22**, wherein the resilient finger elements further comprise at least one ridge configured to engage threads in the bone plate recess.

24. The drill guide of **claim 20**, the alignment assembly further comprising a
15 housing having a first axial bore configured to slidably receive at least a portion of the location post.

25. The drill guide of **claim 24**, the location post having a retracted position in which a first length of the location post is received within the bore and an extended position in which a second length of the location post is received within the bore,
20 wherein the first length is greater than the second length.

26. The drill guide of **claim 25**, the alignment assembly further comprising a spring element disposed at least partially within a second axial bore in the housing to bias the location post to the extended position.

27. The drill guide of **claim 26**, the guide barrel further comprising a bore with a bore axis, and a distal plate-engaging end, wherein the distal plate-engaging end comprises a nose portion configured to be received within the first or second fastener hole to align the bore with the bone screw hole.
- 5 28. The drill guide of **claim 27**, wherein the nose portion comprises a conical shape.
29. The drill guide of **claim 27**, the housing first axial bore and the guide barrel bore forming an acute angle therebetween.
30. The drill guide of **claim 26**, wherein when the location post is received within
10 the bone plate recess and the location post is in the extended position, the guide barrel distal end is located a first distance from the top surface of the bone plate.
31. The drill guide of **claim 26**, wherein when the location post is received within the bone plate recess and the location post is in the retracted position, the guide barrel distal end contacts second bone screw hole.
- 15 32. The drill guide of **claim 20**, the drill guide further comprising a handle associated with the guide barrel, the handle configured to be selectively rotatable with respect to the guide barrel in a first plane.
33. The drill guide of **claim 32**, wherein the first plane is substantially perpendicular to the longitudinal axis of the guide barrel bore.
- 20 34. The drill guide of **claim 32**, further comprising a handle swivel assembly having a locked position in which the handle can not rotated with respect to the guide barrel, and an unlocked position in which the handle is freely rotatable with respect to the guide barrel.

35. The drill guide of **claim 34**, wherein the swivel assembly comprises at least one non-metallic bearing.

36. The drill guide of **claim 34**, wherein the swivel assembly comprises a drain hole configured to allow fluid to drain from the assembly subsequent to sterilization
5 of the drill guide.

37. The drill guide of **claim 20**, wherein the location post is axially fixed to the alignment assembly.

38. A drill guide assembly comprising:
a guide barrel having a tool receiving portion comprising a longitudinal
10 bore having a bore axis, and an aligning assembly portion;
an aligning assembly comprising a guide barrel engaging portion, a housing and a location post having a post axis,
a bone plate having at least two bone screw holes and a positioning recess, the positioning recess configured to receive at least a
15 portion of the location post, the center of the positioning recess being separated from the center of at least one of the bone screw holes by a first distance,
wherein the bore axis is located a second distance from the location post axis, the first and second distances being substantially equal so that when the location post
20 engages the bone plate recess, the bore is substantially coaxial with the at least one fixation hole.

39. The surgical drill guide assembly of **claim 38**, further comprising a handle member associated with a proximal end of the guide barrel.

40. The surgical drill guide assembly of **claim 39**, wherein the handle member is pivotable in relation to the guide barrel.

41. The surgical drill guide assembly of **claim 38**, wherein the guide barrel has at least one depth stop surface configured to coact with a corresponding stop surface of a bone cavity forming tool when the tool is received within the bore to prevent the tool from passing completely through the guide barrel bore.

42. The surgical drill guide assembly of **claim 40**, the handle further having a locked position in which the handle is rotationally coupled to the guide barrel, and an unlocked position in which the handle is freely rotatable with respect to the guide barrel.

43. The surgical drill guide assembly of **claim 42**, further comprising:
a locking button having an actuation end and a locking end, the locking end having at least one radial projection, the button further having an unactuated position and an actuated position;
the handle comprising a bore configured to slidably receive at least a portion of the button, the bore further comprising a radial recess configured to receive the radial projection; and
a handle extension having a handle engaging end and a guide barrel engaging end, the handle engaging end having at least one radial groove configured to receive the radial projection;
wherein when the handle is in the unactuated position, the radial projection engages the radial recesses of the handle bore and the handle extension to configure the handle in the locked position.

44. The drill guide of **claim 43**, wherein when the handle is in the actuated position, the radial projection engages the radial recess of only one of the handle bore and the handle extension to configure the handle in the unlocked position.
45. The drill guide of **claim 43**, the location post further comprising a plate
5 engaging end having a plurality of resilient fingers configured to axially lock the drill guide to the bone plate when the location post is engaged with the recess.
46. The drill guide of **claim 45**, the location post plate engaging end having at least one circumferential ridge configured to engage a bottom surface of the bone plate when the location post is engaged with the recess.
- 10 47. A drill guide assembly comprising:
a guide barrel having a tool receiving portion comprising a longitudinal
bore having a bore axis, and an aligning assembly portion;
an aligning assembly comprising a guide barrel engaging portion, a
housing and a location post having a post axis,
15 a bone plate having at least two fastener receiving holes and a drill guide
positioning recess, the recess configured to receive at least a
portion of the location post, the center of the recess being
separated from the center of at least one of the bone screw
holes by a first distance,
20 wherein the bore axis is located a second distance from the location post axis as
measured between the distal ends of the guide barrel and the location post, the first
and second distances being substantially unequal so that when the location post
engages the bone plate recess, the bore is not coaxial with the at least one fixation
hole.

48. The drill guide assembly of **claim 47**, wherein the difference between the first and second distances is from about 0 millimeters (mm) to about 0.8 mm.

49. The drill guide assembly of **claim 47**, wherein the second distance is about .0.5 mm longer than the first distance.

- 5 50. A method for drilling a hole in bone, comprising the steps of:
- providing a bone plate having at least a first pair of fastener receiving holes
and a drill guide aligning recess;
applying the plate to the bone surface;
providing a drill guide having a guide bore for receiving a tool and an
- 10 alignment mechanism associated with the guide bore and including a
location post having a proximal alignment mechanism engaging end
and a distal plate engaging end;
inserting the plate engaging end of the location post into the recess in the
bone plate,
- 15 rotating the location post within the recess in the bone plate to align the
guide bore with a first selected one of the pair of fastener receiving
holes;
inserting and advancing a tool through the guide bore to contact the bone
surface underlying the selected fastener receiving hole; and
- 20 applying rotational and/or axial force to the tool to creating a cavity in the
bone underlying the selected fastener receiving hole.

51. The method of **claim 50**, wherein the alignment mechanism further comprises a spring element to bias the location post distally axially away from the alignment mechanism, the guide bore further comprising a distal end adjacent the

distal end of the location post, the guide bore distal end comprising a conical nose portion configured to engage an inner surface of at least one of the pair of fastener receiving holes, wherein the step of aligning the guide bore with a selected one of the pair of fastener receiving holes further comprises engaging the guide bore nose
5 with the inner surface of the at least one of the pair of fastener receiving holes.

52. The method of **claim 50**, further comprising the step of rotating the location post within the hole, slot, or indentation in the bone plate to align the guide bore with the second one of the pair of fastener receiving holes; inserting and advancing the tool through the guide bore to contact the bone surface underlying the second
10 fastener receiving hole; and applying rotational and/or axial force to the tool to create a cavity in the bone underlying the second fastener receiving hole.

53. The method of **claim 52**, wherein the tool is an awl, drill or tap.

54. The method of **claim 52**, further comprising the steps of disengaging the location post from the recess in the plate to disassociate the drill guide from the
15 bone plate, inserting a bone fastener through one of the first and second fastener receiving holes and into the cavity in the bone underlying the fastener receiving hole, and engaging the fastener with the fastener receiving hole and the bone to fix the plate to the bone.

55. The method of **claim 50**, wherein the drill guide bore and alignment
20 mechanism are offset from each other so that when the location post is rotated within the bone plate recess to align the guide bore with a first selected one of the pair of fastener receiving holes, the guide bore axis is offset from the center of the fastener receiving hole.

56. The method of **claim 55**, wherein the steps of inserting and advancing a tool through the guide bore to contact the bone surface underlying the selected fastener receiving hole; and applying rotational and/or axial force to the tool to creating a cavity in the bone underlying the selected fastener receiving hole comprise creating
5 a cavity having an axis that is not collinear with the axis of the fastener receiving hole.